USGS
science for a changing world

125 years of science for America 1879–2004

Mineral Industry Surveys

For information, contact:
Jozef Plachy, Zinc Commodity Specialist
U.S. Geological Survey
989 National Center
Reston, VA 20192
Telephone: (703) 648-4982, Fax: (703) 648-7757
E-mail: jplachy@usgs.gov

Samir Hakim (Data)
Telephone: (703) 648-4998
Fax: (703) 648-7975
E-mail: shakim@usgs.gov

Internet: http://minerals.usgs.gov/minerals

ZINC IN DECEMBER 2004

Domestic mine production in December of 58,500 metric tons (t) was about 1% less than that in November and about 7% less than in December 2003, according to the U.S. Geological Survey. According to preliminary data, mine production in 2004 was about 4% less than that in 2003. Estimated smelter production of 20,200 t was about 14% less than in November but was the same as in December 2003. Preliminary smelter production in 2004 was about 6% higher than that in 2003. Apparent zinc consumption in the United States of 98,200 t was about 2% more than in November and about the same as in December 2003.

The Platts Metals Week average monthly composite price for North American Special High Grade zinc increased to 58.53 cents per pound in December. The price was about 22% (10.68 cents) higher than in December 2003 and was the highest monthly level in about 4 years.

The London Metal Exchange (LME) zinc price reached a 4-year high of $1,260 per metric ton at yearend 2004. Owing to the limited concentrate supply, even a small amount of spot buying gave zinc prices a larger increase than expected based on general market patterns (Platts Metals Week, 2005). In addition to the high LME price, European consumers faced rising premiums, which for special high grade zinc had increased by $10 to $85 per metric ton since 2003. With the exception of some steel mills that wanted to ensure sufficient supplies of zinc for galvanizing, many consumers were reluctant to sign contracts for 2005 in the hope that the premiums would come down. Given the tight concentrate market and higher treatment charges for 2005, however, market analysts anticipated that the premiums would most likely remain high (Metal Bulletin, 2004).

The International Lead and Zinc Study Group reported that according to preliminary data for 2004, there was a 248,000-t production shortfall of zinc metal on the world market, following large surpluses during the preceding 3 years. Zinc use in 2004 grew by 5.5% while supply increased by only 2.7%, mainly owing to the insufficient supply of concentrates, production of which increased by only 1.1% in 2004 (International Lead and Zinc Study Group, 2005§[1]).

According to CRU International Ltd., concentrates were expected to remain in short supply in 2005, metal output would remain constrained, and a large statistical production deficit of nearly 500,000 t would result. LME stocks could decline to only 5 weeks of supply, a level which has historically indicated a tight market. This deficit could continue into 2006 because of the long lead time for new mine development, although some plans for new mines were starting to appear. Apex Silver Mines Ltd. decided that market prospects were strong enough to commit to developing the San Cristobal deposit in Bolivia (CRU International Ltd., 2005). San Cristobal is primarily a silver mine, but it also contains about 3.6 million metric tons (Mt) of zinc within 210 Mt of proven and probable ore reserves that would be minable by open pit methods (Apex Silver Mines Ltd., [undated]§).

In Italy, while high electricity prices plagued the Porto Vesme electrolytic zinc refinery, high coke prices have been the problem for the Porto Vesme imperial smelting furnace. The price of coke, imported mainly from China, doubled in 2004 compared with the price in 2003. The high energy prices, coupled with failure of the unions and the management to reach an agreement, could lead to closure of the Porto Vesme complex in Sardinia (owned by Glencore International AG of Switzerland). If the complex closes, the zinc concentrate was expected to be quickly absorbed by other smelters, but the bulk lead-zinc concentrate from the McArthur River Mine in Australia would be much harder to sell because the number of smelters using the imperial smelting process is diminishing. The Porto Vesme complex is a leading employer in the economically depressed region of southwest Sardinia, and the unions were expected to fight any closure or job losses (CRU Monitor, 2005§).

In China, power shortages in the southern part of the country forced many zinc smelters to reduce output in 2004. For

[1]References that include a section mark (§) are found in the Internet References Cited section.

example, the Longcheng smelter in Liuzhou operated at an average rate of 65% of capacity in 2004, and Zhuye Torch Metals Co. Ltd. (known as Zhuzhou) in Hunan, China's second largest zinc producer, had to lower production rates by about 30%. Smelters in northern China, where power supplies were more stable, had to contend with a tight concentrate market, as well as rising power costs and limited water and fuel supplies. Production at the Huludao Zinc Industry Co. in Liaoning Province amounted to only about 230,000 t of zinc in 2004 despite having a capacity of 330,000 metric tons per year (t/yr) of zinc (Metal-Pages, 2005b§).

Production of zinc concentrate in China was 1.69 Mt in 2004, a 4.6% increase compared with that in 2003. Refined zinc production totaled 2.54 Mt, a 10.2% increase over that of 2003. Despite the increased production, a growing deficit was offset by a 76% increase in imports of refined zinc and reduced exports of concentrate (17%), metal (50%), and oxide (31%) (Antaike, 2005).

Nippon Mining Holdings Inc. announced that it would close its Toyoha Mine (Hokkaido, northern Japan), the last remaining zinc mine in Japan, in March 2006. The reason for closure is the depletion of resources and failure of a nearly year-long exploratory drilling program to find new resources (Metal-Pages, 2005a§).

Update

In January 2005, British ZincOx Resources plc began a feasibility study for a new zinc recycling plant in the United States. The company entered into a strategic alliance with Envirosafe Services of Ohio, Inc. (ESOI) to recover zinc from electric arc furnace (EAF) dust. EAF dust is either deposited in special landfills, at great cost to the steel mills, or processed in Waelz kilns to produce zinc concentrate and other metals. The process is not cost effective and relies heavily on a subsidy from steel mills. Worldwide, there are about 3.2 Mt of EAF dust containing about 0.7 Mt of zinc (about 7% of annual global consumption). Under the terms of the agreement, ESOI will provide dust for the new plant and will be responsible for disposal of plant residues. The plant, using technology developed by ZincOx, was expected to be located in the midwestern United States and was expected to produced about 25,000 t/yr of contained zinc in either high purity zinc oxide or special high grade zinc metal. The feasibility study was expected to be completed by yearend 2005 (ZincOx Resources plc, [undated]§).

References Cited

Antaike, 2005, Market commentary: Antaike Monthly, no. 99, February, p. 5-6.

CRU International Ltd., 2005, Executive summary: CRU Zinc quarterly, 10 p.

Metal Bulletin, 2004, Consumers resist rise in European zinc premiums: Metal Bulletin, no. 8873, December 20, p. 15.

Platts Metals Week, 2005, Lead, zinc prices jump in thin market: Platts Metals Week, v. 76, no. 1, January 3, p. 9

Internet References Cited

Apex Silver Mines Ltd., [undated], San Cristobal, accessed February 17, via URL http://www.apexsilver.com.

CRU Monitor, 2005, What is the future for Sardinian zinc smelter?, accessed January 28, 2005, via URL http://www.crumonitor.com.

International Lead and Zinc Study Group, 2005, accessed March 2, via URL http://www.ilzsg.org.

Metal-Pages, 2005a (February 10), Nippon Mining to close last Japanese zinc/lead mine, accessed February 10, 2005, via URL http://www.metal-pages.com.

Metal-Pages, 2005b (January 20), Power shortage hits Zhuzhou Zn output and rallies LME price, accessed January 20, 2005, via URL http://www.metal-pages.com.

ZincOx Resources plc, [undated], Low cost of zinc through innovation, accessed February 16, 2005, via URL http://www.zincox.com.

TABLE 1
SALIENT ZINC STATISTICS[1]

(Metric tons, unless otherwise specified)

	2003	2004			
	January-December	October	November	December	January-December
Production:					
Mine, zinc content of concentrate	768,000	64,200	59,300	58,500	738,000
Mine, recoverable zinc	738,000	61,600	56,800	56,100	712,000
Smelter, refined zinc	272,000	23,800 e	23,500 e	20,200 e	320,000
Consumption:					
Refined zinc, reported	423,000	34,600 r	34,300	33,400	421,000
Ores[e] (zinc content)	727	61	61	61	727
Zinc-base scrap[e] (zinc content)	191,000	15,900	15,900	15,900	191,000
Copper-base scrap[e] (zinc content)	176,000	14,700	14,700	14,700	176,000
Aluminum-and magnesium-base scrap[e] (zinc content)	1,430	120	120	120	1,430
Total[e]	791,000	65,400	65,000	64,100	790,000
Apparent consumption, metal[2]	1,050,000	83,500	96,400	98,200 [3]	1,160,000 [3]
Stocks of refined (slab) zinc, end of period:					
Producer[4]	XX	7,070	6,780	6,430	XX
Consumer[5]	XX	54,000	54,300	56,300	XX
Merchant	XX	9,970	10,600	10,200	XX
Total	XX	71,000	71,600	73,000	XX
Shipments of zinc metal from Government stockpile	13,600	--	--	--	28,900
Imports for consumption:					
Refined (slab) zinc	758,000	73,600	80,800	NA	750,000 [6]
Oxide (gross weight)	98,300	7,510	9,420	NA	96,200 [6]
Ore and concentrate (zinc content)	164,000	13,100	8,460	NA	201,000 [6]
Exports:					
Refined (slab) zinc	1,680	93	155	NA	3,210 [6]
Oxide (gross weight)	12,100	864	960	NA	12,800 [6]
Ore and concentrate (zinc content)	841,000	118,000	5,140	NA	712,000 [6]
Waste and scrap (gross weight)	50,200	4,710	5,500	NA	49,800 [6]
Price:					
London Metal Exchange, average, dollars per metric ton	$827.32	$1,064.49	$1,095.18	$1,179.83	$1,047.35
Platts Metals Week North American Special High Grade, average, cents per pound	40.63	53.31	54.81	58.53	52.47

[e]Estimated. [r]Revised. NA Not available. XX Not applicable. -- Zero.

[1]Data are rounded to no more than three significant digits; except prices; may not add to totals shown.

[2]Smelter production plus imports minus exports plus shipments from Government stockpile plus stock change.

[3]Data based on reported consumption, stocks, and estimated trade data.

[4]Data from U.S. Geological Survey and American Bureau of Metal Statistics.

[5]Includes an estimate for companies that report annually.

[6]Includes data through November only.

TABLE 2
REFINED ZINC PRODUCED IN THE UNITED STATES[1]

(Metric tons)

Month	Beginning stocks[2]	Production	Shipments	Ending stocks[2]
2003:				
December	8,010	20,200	20,500	7,660
Year	XX	272,000	273,000	XX
2004:				
January	7,660	26,900	28,100	6,440
February	6,440	26,900	28,100	5,230
March	5,230	28,900	28,200	5,960
April	5,960 e	29,600	28,300	7,300
May	7,300 e	28,600	28,300	7,660
June	7,660 e	28,600 e	29,900	6,340
July	6,340 e	29,200 e	29,200	6,390
August	6,390 e	29,300 e	29,300	6,370
September	6,370 e	24,100 e	23,400	7,020
October	7,020 e	23,800 e	23,700	7,070
November	7,070 e	23,500 e	23,800	6,780
December	6,780 e	20,200 e	20,500	6,430
January-December	XX	320,000	321,000	XX

[e]Estimated. XX Not applicable.
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Includes stocks held at locations other than smelters.

Sources: U.S. Geological Survey and American Bureau of Metal Statistics.

TABLE 3
APPARENT CONSUMPTION OF REFINED ZINC
ACCORDING TO INDUSTRY USE AND PRODUCT[1]

(Metric tons)

Industry and product	2003 January-December	2004 October	2004 November	2004 December[2]	2004 January-December[2]
Galvanizing:					
Sheet and strip	442,000	34,500	39,800	40,500	477,000
Other	146,000	11,200	13,800	14,400	167,000
Total	588,000	45,800	53,600	54,900	644,000
Brass and bronze	167,000	13,200	15,300	15,200	188,000
Zinc-base alloy	222,000	17,900	20,300	20,900	244,000
Other uses[3]	70,700	6,500	7,200	7,300	85,800
Grand total	1,050,000	83,500	96,400	98,200	1,160,000

[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Data based on reported consumption, stocks, and estimated trade data.
[3]Includes zinc used in making zinc dust, desilvering lead, powder, alloys, anodes, chemicals, castings, light metal alloys, rolled zinc, and miscellaneous uses not elsewhere specified.

TABLE 4
AVERAGE MONTHLY ZINC PRICES[1]

Period	North American ¢/lb.	LME[2] cash ¢/lb.	LME[2] cash $/t
2003:			
December	47.85	44.33	977.35
Year	40.63	37.53	827.32
2004:			
January	49.93	46.11	1,016.62
February	53.84	49.32	1,087.26
March	55.25	50.14	1,105.37
April	52.09	46.82	1,032.28
May	51.76	46.63	1,027.93
June	51.33	46.32	1,021.08
July	50.08	44.81	987.94
August	49.44	44.24	975.39
September	49.23	44.22	974.83
October	53.31	48.28	1,064.49
November	54.81	49.68	1,095.18
December	58.53	53.52	1,179.83
January-December	52.47	47.51	1,047.35

[1]Special High Grade.
[2]London Metal Exchange.

Source: Platts Metals Week.

TABLE 5
U.S. EXPORTS OF ZINC[1]

Material	2003 Quantity (metric tons)	2003 Value (thousands)	2004[2] November Quantity (metric tons)	2004[2] November Value (thousands)	2004[2] Year to date Quantity (metric tons)	2004[2] Year to date Value (thousands)
Refined (slab) zinc	1,680	$1,760	155	$284	3,210	$5,220
Ore and concentrate (zinc content)	841,000	337,000	5,140	3,340	712,000	403,000
Waste and scrap (gross weight)	50,200	32,600	5,500	5,840	49,800	44,100
Powders, flakes, dust (zinc content)	6,550	9,090	551	1,060	6,980	12,300
Oxide (gross weight)	12,100	15,200	960	1,440	12,800	17,700
Chloride (gross weight)	1,470	1,650	125	163	1,720	2,050
Sulfate (gross weight)	2,310	1,440	187	129	2,690	1,630
Compounds, other (gross weight)	183	472	24	77	187	658

[1]Data are rounded to no more than three significant digits.
[2]Data for December 2004 were not available at time of publication.

Source: U.S. Census Bureau.

TABLE 6
U.S. IMPORTS FOR CONSUMPTION OF ZINC[1]

Material	2003		2004[2]			
			November		Year to date	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
Refined (slab) zinc	758,000	$647,000	80,800	$86,200	750,000	$821,000
Ore and concentrate (zinc content)	164,000	60,000	8,460	4,680	201,000	80,400
Waste and scrap (gross weight)	10,300	5,740	1,490	1,110	9,790	6,890
Powders, flakes, dust (zinc content)	27,400	41,200	1,990	3,190	23,300	37,900
Oxide (gross weight)	98,300	72,200	9,420	8,560	96,200	82,700
Chloride (gross weight)	663	914	24	56	681	806
Sulfate (gross weight)	25,800	11,700	3,470	1,560	27,100	12,900
Compounds, other (gross weight)	1,010	951	568	605	3,840	3,570

[1]Data are rounded to no more than three significant digits.
[2]Data for December 2004 were not available at time of publication.

Source: U.S. Census Bureau.

TABLE 7
SHIPMENTS OF ZINC METAL FROM THE NATIONAL DEFENSE STOCKPILE[1]

(Metric tons)

Period	Beginning inventory	Shipments	Ending inventory
2003:			
December	102,000	6,270	95,200
Year	XX	13,600	XX
2004:			
January	95,200	3,340	91,900
February	91,900	--	91,900
March	91,900	2,920	89,000
April	89,000	3,340	85,600
May	85,600	14,700	70,900
June	70,900	1,170	69,800
July	69,800	44	69,700
August	69,700	3,360	66,400
September	66,400	--	66,400
October	66,400	--	66,400
November	66,400	--	66,400
December	66,400	--	66,400
January-December	XX	28,900	XX

XX Not applicable. -- Zero.
[1]Data are rounded to no more than three significant digits; may not add to totals shown.

Source: Defense Logistics Agency.

TABLE 8
U.S. IMPORTS OF ZINC, BY TYPE OF MATERIAL AND COUNTRY[1,2]

(Metric tons)

Material and country	General imports			Imports for consumption		
		2004			2004	
	2003	November	Year to date	2003	November	Year to date
Ore and concentrate (zinc content):						
Australia	43,400	--	19,300	43,400	--	19,300
Ireland	36,500	--	14,400	36,500	--	14,400
Mexico	9,400	369	6,340	9,400	369	6,340
Peru	74,600	8,090	160,000	74,600	8,090	160,000
Other	--	--	877	--	--	877
Total	164,000	8,460	201,000	164,000	8,460	201,000
Blocks, pigs, or slab:						
Australia	22,000	--	7,940	14,400	25	27,400
Brazil	27,600	2,470	26,400	22,400	2,470	26,400
Canada	498,000	41,200	455,000	498,000	41,200	455,000
China	23,800	--	35	48	507	12,300
Japan	50	--	--	--	--	690
Kazakhstan	19,700	--	2,310	19,700	--	2,310
Korea, Republic of	34,000	300	8,030	1,340	5,180	31,900
Mexico	141,000	10,000	111,000	141,000	10,000	111,000
Namibia	16,100	15,200	47,900	16,100	15,200	47,900
Peru	43,400	6,150	25,600	42,900	6,150	30,500
Poland	1,600	--	--	1,600	--	--
Other	1,050	--	205	121	--	3,970
Total	829,000	75,400	685,000	758,000	80,800	750,000
Dross, ashes, fume (zinc content)	14,100	1,670	14,800	14,100	1,670	14,800
Grand total	1,010,000	85,500	901,000	936,000	90,900	966,000
Oxide (gross weight):						
Canada	47,300	5,080	46,400	47,300	5,080	46,400
China	575	--	207	575	--	207
Italy	770	1,920	12,300	770	1,920	12,300
Japan	965	120	1,010	965	120	1,010
Mexico	40,500	1,960	31,200	40,500	1,960	31,200
Netherlands	4,820	308	4,360	4,820	308	4,360
Other	3,420	28	678	3,420	28	678
Total	98,300	9,420	96,200	98,300	9,420	96,200
Other (gross weight):						
Waste and scrap	10,300	1,490	9,790	10,300	1,490	9,790
Sheets	1,790	161	2,450	1,790	161	2,450
Powders, flakes, dust (zinc content)	27,500	1,990	23,300	27,400	1,990	23,300

-- Zero.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Data for December 2004 were not available at time of publication.

Source: U.S. Census Bureau.